

REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections contained in the Office Action of May 20, 2005 is respectfully requested.

In the final Office Action and in the Advisory Action of August 31, 2005, the Examiner indicated that certain limitations in the pending claims would not be given patentable weight because they are “process” limitations. Consequently, the Examiner rejected independent claims 21 and 26 as being anticipated by the Yasui reference (USP 4,523,862); and rejected the dependent claims as being either anticipated by or unpatentable over the Yasui reference. However, as indicated above, independent claims 21 and 26 have now been further amended so as to clarify the structure of the present invention. For the reasons discussed below, it is respectfully submitted that amended independent claims 21 and 26 and the claims that depend therefrom are clearly patentable over the prior art of record.

As indicated above, the present claims have now been amended so as to clarify the material of the inner ring and the tapered rollers, and to further clarify the shape and arrangement of the rib surface of the inner ring. Specifically, independent claims 21 and 26 now recite that a roller bearing has a *steel* inner ring, and *steel* tapered rollers. Furthermore, a large rib surface of the inner ring has a conical surface for contacting large end faces of the tapered rollers, a *flank* smoothly connected to a conical surface, and a *chamfer connected to a radio outer edge of the flank*. The large rib surface is shaped so that a boundary between the conical surface and the flank is located at an outer edge at a maximum contact oval formed by the contact between the large end face of each of the tapered rollers and the conical surface of the large rib surface, and so that a *wedge-shaped space* is defined between the flank and the large end face of each of the tapered rollers. The wedge-shaped space is shaped and arranged to smoothly draw lubricating oil from an outer location to a location between the conical surface and the large end face of each of the tapered rollers so as to at least minimize damage to the large end faces of the tapered rollers.

Figure 9 of the present application illustrates the structural relationship described above, and paragraphs [0098] and [0099] of the original specification describe the relationship. Of

course, reference to these portions of the application is provided only for the Examiner's benefit, and is not intended to otherwise limit the scope of the invention.

In order to facilitate a discussion of the present invention, a marked-up copy of Figure 9 has been provided herewith as Appendix A. Figure 9 clearly illustrates the various portions of the large rib surface 41, including the conical surface 41a, the flank 41b, and the chamfer 41c (see paragraph [0098]). The outer edge of the maximum contact oval 45 is identified by the letter "X" in Appendix A, and letter "X" *also* identifies the boundary between the conical surface 41a and the flank 41b (see paragraph [0099]). The steel material of the inner ring and the tapered rollers (see paragraph [0102]) ensures the recited proper formation of the maximum contact oval and the relationships mentioned above. Figure 9 also clearly illustrates the wedge-shaped space that is defined between the flank and the large end face 43 of each of the tapered rollers 42, and illustrates how the wedge-shaped space is shaped and arranged to smoothly draw lubricating oil from an outer location (e.g., the recess 44) to a location between the conical surface 41a and the large end face 43 of each of the tapered rollers. Consequently, damage to the large end faces 43 of the tapered rollers 42, which will occur if the tapered rollers are skewed relative to the inner ring 40 during operation of the tapered roller bearing, can be minimized or eliminated.

For comparison purposes, an illustration of a conventional roller bearing, such as that of the Yasui reference, has been prepared and submitted herewith as Appendix B. Although the Examiner asserted that the Yasui reference discloses "all claimed subject matter" of the previously-pending claims, it is submitted that the Yasui reference does not disclose or suggest **both** a *flank* smoothly connected to a conical surface of a large rib surface **and** a *chamfer* connected to a radially outer edge of the flank. In contrast, as illustrated in Appendix B which corresponds to any of Figures 1, 4, 5, and 7 of the Yasui reference, the conventional roller bearing includes *only* a chamfer. Thus, there is no flank, and there is no wedge-shaped space formed between the flank and a large end face of a roller. Furthermore, the outer edge (indicated by the letter "X") of the maximum contact oval 45 is not located at a boundary between the conical surface and a flank because, as explained above, the conventional roller bearing such as that of the Yasui reference does not disclose or suggest a flank. Instead, a boundary "Y" is

located between the conical surface and the *chamfer*, and is located well away from the outer edge of the maximum contact oval, as indicated by the letter "X." As a result, very little lubricating oil will reach the contact oval 45, thereby resulting in excess damage if the tapered rollers become skewed relative to the inner ring during operation of the tapered roller bearings.

Due to the absence of any teaching or suggestion of a large rib surface having a conical surface, a flank smoothly contacted to the conical surface, and a *chamfer connected to a radial outer edge of the flank*, it is submitted that one of ordinary skilled in the art would not be motivated to modify the Yasui reference so as to obtain the invention recited in amended independent claims 21 and 26. Accordingly, it is respectfully submitted that amended independent claims 21 and 26, and the claims that depend therefrom, are clearly patentable over the prior art of record.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. However, if the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact the Applicant's undersigned representative.

Respectfully submitted,

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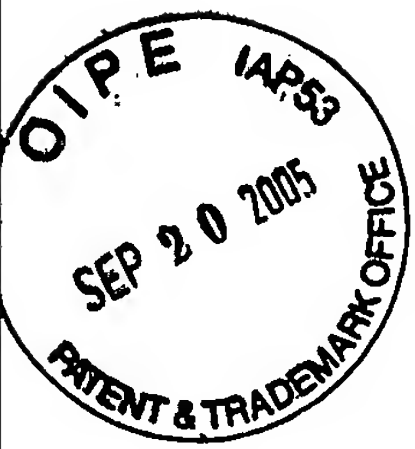
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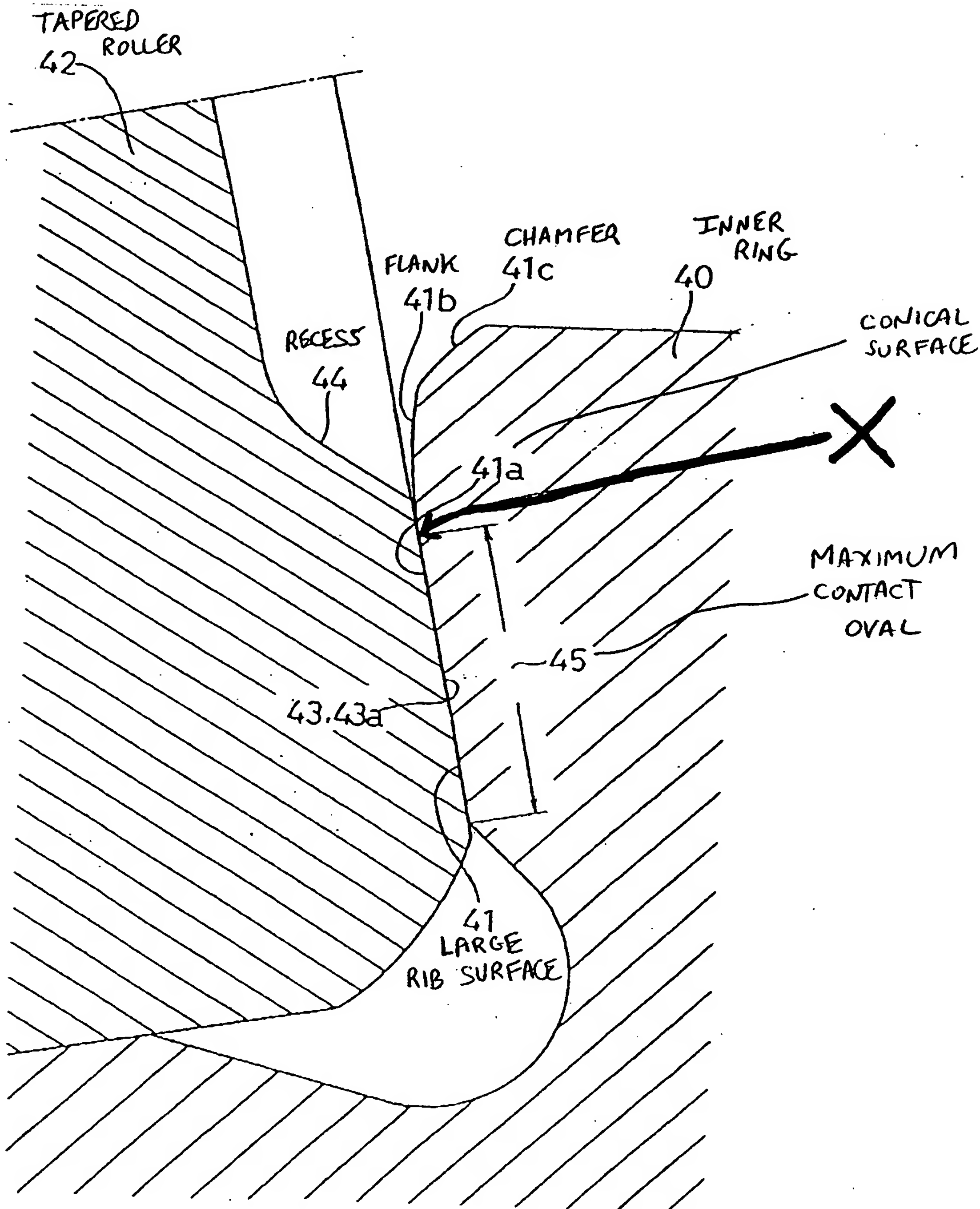
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APPENDIX A

NOTE: THIS NOT AN ACTUAL OR PROPOSED
DRAWING AMENDMENT; IT IS MERELY FOR
ILLUSTRATIVE PURPOSES

FIG. 9





APPENDIX B

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